

RoHS Compliant Product

Description

The SM2113 series of positive, linear regulators feature low quiescent current (30µA typ.) with low dropout voltage, making them ideal for battery applications. These rugged devices have both Thermal Shutdown, and Current Fold-back to prevent device failure under the "Worst" of operating conditions. The SM2113 is stable with an output capacitance of 2.2µF or greater.

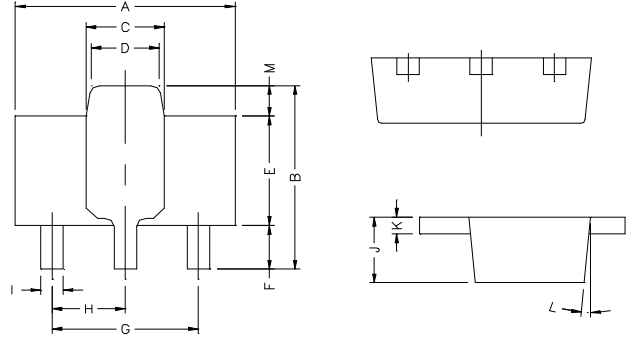
Features

- * High Accurate $\pm 1.5\%$
- * Over-Temperature Shutdown
- * Factory Pre-set Output Voltage
- * Very Low Dropout Voltage
- * Low Temperature Coefficient
- * Short Circuit Current Fold-back
- * Guaranteed 300mA output
- * Current Limiting

Applications

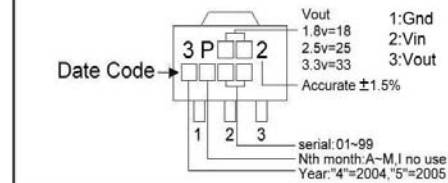
- * PC Peripherals
- * Wireless Devices
- * Portable Electronics
- * Battery Powered Widgets
- * Electronic Scales
- * Instrumentation
- * Cordless Phones

SOT-89

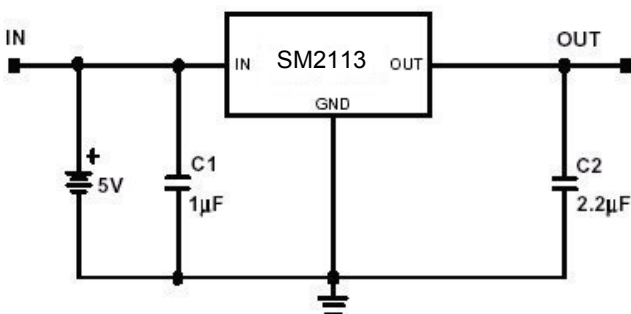


REF.	Millimeter		REF.	Millimeter	
	Min.	Max.		Min.	Max.
A	4.4	4.6	G	3.00	REF.
B	4.05	4.25	H	1.50	REF.
C	1.50	1.70	I	0.40	0.52
D	1.30	1.50	J	1.40	1.60
E	2.40	2.60	K	0.35	0.41
F	0.89	1.20	L	5° TYP.	
			M	0.70 REF.	

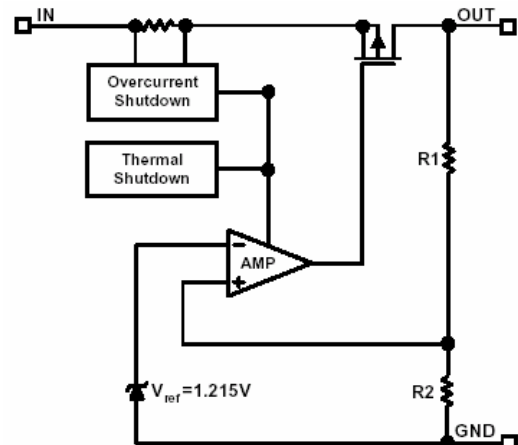
Marking :



Typical Application Circuit



Block Diagram



Absolute Maximum Ratings

Parameter	Symbol	Ratings	Unit
Input Voltage	V_{IN}	8	V
Output Current	I_{OUT}	$P_D/(V_{IN}-V_O)$	mA
Output Voltage	V_{OUT}	1.3~5	V
Operating Ambient Temperature	T_{opr}	-40~+85	°C
Junction Temperature	T_j	-40~+125	°C
Max. Junction Temperature	$T_j \text{ Max.}$	150	°C
Thermal Resistance	θ_{jc}	38	W/°C
	θ_{ja}	180	W/°C
Power Dissipation ($\Delta T=100^\circ\text{C}$)	P_D	550	mW
EDS Classification		B	

Electrical Characteristics $T_a=25^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
Output Voltage	$V_{OUT(E)}^1$	-1.5%	$V_{OUT(E)}^2$	1.5%	V	$V_{IN}=V_{OUT(T)}+1V, I_o=1mA$	
Output Current	I_o	300	-	-	mA	$V_{IN}=V_{OUT(T)}+2V, V_{OUT} \geq V_{OUT(E)} * 0.96$	
Current Limit	I_{LIM}	300	450	-	mA	$V_o > 1.2V$	
Load Regulation	REG_{LOAD}	-1	0.2	1	%	$V_{IN}=V_{OUT(T)}+2V, I_o=1mA \text{ to } 300mA$	
Dropout Voltage	$V_{DROPOUT}$	-	-	1300	mV	$1.3V \leq V_{OUT(T)} \leq 2.0V$	$I_o=300mA$ $V_o=V_{OUT(E)}-2\%$
		-	-	400		$2.0V < V_{OUT(T)} \leq 2.8V$	
		-	-	300		$2.8V < V_{OUT(T)}$	
Quiescent Current	I_q	-	30	50	µA	$V_{IN}=V_{OUT(T)}+1V$	
Line Regulation	REG_{LINE}	-0.2	-	0.2	%	$1.3V \leq V_{OUT(T)} \leq 1.4V$	$I_o=1mA$ $V_{IN}=V_{OUT(T)}+1$ to $V_{OUT(T)}+2$
		-0.15	-	0.15		$1.4V < V_{OUT(T)} \leq 2.0V$	
		-0.1	0.02	0.1		$2.0V < V_{OUT(T)} < 4.0V$	
		-0.4	0.2	0.4		$4.0V \leq V_{OUT(T)}$	
Input Voltage	V_{IN}	Note ³	-	7	V		
Over Temperature Shutdown	O_{TS}	-	150	-	°C		
Over Temperature Hystersis	O_{TH}	-	30	-	°C		
Output Voltage Temperature Coefficient	T_C	-	30	-	ppm/°C		
Short Circuit Current ⁴	I_{SC}	-	150	300	mA	$V_{IN}=V_{OUT(T)}+1V, V_{OUT}=0V$	
PSRR	PSRR	-	50	-	dB	f=1kHz	$I_o=100mA$ $C_o=2.2\mu F$
		-	20	-		f=10kHz	
		-	15	-		f=100kHz	
Output Voltage Noise	eN	-	30	-	µVrms	$C_o=2.2\mu F$ f=10Hz~100kHz $I_o=10mA$	

Note 1: $V_{OUT(E)}$ = Effective Output Voltage (i.e. the output voltage when " $V_{OUT(T)} + 1.0V$ " is provided at the V_{IN} pin while maintaining a certain I_{OUT} value).

2: $V_{OUT(T)}$ = Specified Output Voltage

3: $V_{IN(MIN)} = V_{OUT} + V_{DROPOUT}$

4: To prevent the Short Circuit Current protection feature from being prematurely activated, the input voltage must be applied before a current source load is applied.

Ordering Information(contd.)

Part Number	Marking	Output Voltage	Part Number	Marking	Output Voltage
SM2113-13	3P132 XXXX	1.3V	SM2113-15	3P152 XXXX	1.5V
SM2113-18	3P182 XXXX	1.8V	SM2113-19	3P192 XXXX	1.9V
SM2113-20	3P202 XXXX	2.0V	SM2113-25	3P252 XXXX	2.5V
SM2113-27	3P272 XXXX	2.7V	SM2113-28	3P282 XXXX	2.8V
SM2113-29	3P292 XXXX	2.9V	SM2113-30	3P302 XXXX	3.0V
SM2113-31	3P312 XXXX	3.1V	SM2113-33	3P332 XXXX	3.3V
SM2113-34	3P342 XXXX	3.4V	SM2113-35	3P352 XXXX	3.5V
SM2113-36	3P362 XXXX	3.6V	SM2113-37	3P372 XXXX	3.7V
SM2113-38	3P382 XXXX	3.8V	SM2113-50	3P502 XXXX	5.0V

Characteristics Curve

